

## REMARKS

### Amendments

Claims 1, 16 and 34 have currently been amended and new claims 35-37 have been added. Claims 1-11, 14-16 and 28-37 are currently pending in the present application.

The methods of claims 1, 16 and 34 have been amended for the sake of improved clarity. Specifically, claims 1 and 16 have been amended to clarify that the step of removing particulate material includes using only one step of microfiltration consisting of microfiltration with a cutoff of 0.2  $\mu\text{m}$  to filter out material having a particle size of greater than about 0.2  $\mu\text{m}$  from said extract and produce a filtrate comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$  as a filtrate. In addition, the method of claim 34 has been amended to clarify that the step of removing particulate material includes using only one step of filtration consisting of filtration with a cutoff of 0.2  $\mu\text{m}$  to filter out material having a particle size of greater than about 0.2  $\mu\text{m}$  from said extract and produce a filtrate comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$  as a filtrate. Support for the above amendments is provided, for example, at page 17, lines 9-11 and 18-20 of the description.

New claims 35-37 have been added, which are based on page 17, lines 9-11 of the description.

It is submitted that these amendments do not constitute new matter, and their entry is requested.

### Rejection Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-6, 9, 11, 14-16, 29-32 and 34 under 35 U.S.C. § 103(a) as being unpatentable over Bhatti (U.S. 5,518,710) in view of Potter *et al.* (U.S. 6,323,338) and Jamas *et al.* (U.S. 5,622,939). Applicant respectfully traverses the Examiner's rejection for the reasons set forth below.

Bhatti discloses a method that includes removal of degraded starches from a  $\beta$  glucan extract using centrifugation, dialysis or filtration (column 3, lines 63-65). The method of Bhatti

would not, however, result in the isolation of  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of less than 0.2  $\mu\text{m}$ , but rather a composition that comprises  $\beta$  (1-3)  $\beta$  (1-4) glucans having a *broader* range of particle sizes.

Potter *et al.* teaches a step of concentrating an intermediate solution from which insoluble material and flocculate have been previously removed by means of centrifugation, dialysis, filtration, or passage through a mesh or cloth (see Column 5, lines 19-65). The step of concentrating is conducted using ultrafiltration with a membrane having a cutoff size of 0.2  $\mu\text{m}$  to collect a *retentate* comprising  $\beta$  (1-3)  $\beta$  (1-4) glucans having particle sizes of *greater* than 0.2  $\mu\text{m}$ . (see column 6, lines 26-32 and FIG. 2). Potter *et al.*, therefore, teaches the use of ultrafiltration for concentrating the intermediate solution rather than fractionating that solution into a composition comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$ .

Jamas *et al.* discloses a process for producing an aqueous soluble  $\beta$  (1-3) glucan in triple helix conformation, which includes a step of purifying denatured protein to remove aqueous insoluble glucan and aggregated aqueous soluble glucans by ultrafiltration with a 1000 to 100,000 MW cutoff and a step of purifying re-annealed soluble glucan by size fractionation using separate steps of ultrafiltration with a 30,000 to 100,000 MW cutoff and a 150,000 to 500,000 MW cutoff to remove high and low molecular weight soluble glucans selectively. The Examiner is referred to [www.millipore.com/immunodetection/id3/concentration](http://www.millipore.com/immunodetection/id3/concentration) for an illustration of the molecular weight cutoffs associated with ultrafiltration membranes having pore sizes of between 0.001  $\mu\text{m}$  and 0.1  $\mu\text{m}$ . Jamas *et al.* also indicates that the final glucan solution can be sterilized by filtration through a 0.22  $\mu\text{m}$  filter, however, as this filtration step is conducted after the fractionation steps described above it would not result in any further fractionation of the glucan material. Jamas *et al.* does not teach or suggest the fractionation of a beta glucan solution using only one step of filtration through a 0.22  $\mu\text{m}$  filter. Jamas *et al.* therefore teaches a method that involves using multiple ultrafiltration steps to produce a glucan

solution having a *narrower* range of particle sizes than that of the  $\beta$  (1-3)  $\beta$  (1-4) glucan produced by the presently claimed method.

The cited references do not teach or suggest the presently claimed method, which includes using only one step of microfiltration with a cutoff of 0.2  $\mu\text{m}$  to filter out particulate material having a particle size of greater than about 0.2  $\mu\text{m}$  from an extract to produce a purified extract comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$  as a filtrate. Thus, Applicants submit that the combination of Bhatti, Potter *et al.* and Jamas *et al.* does not render the claimed subject matter obvious.

In view of the above amendments and remarks, Applicants submit that the claimed subject matter is not obvious from the combination of Bhatti, Potter *et al.* and Jamas *et al.* Withdrawal of this rejection is requested.

#### **Rejection Under 35 U.S.C. § 103(a)**

The Examiner has also rejected claims 1-9, 11, 14-16, 29-32 and 34 under 35 U.S.C. § 103(a) as being unpatentable over Bhatti in view of Potter *et al.* and Jamas *et al.* as applied to claims 1-6, 9, 11, 14-16, 29-32 and 34 above, and further in view of Puski *et al.* (U.S. 4,830,861). Applicant respectfully traverses the Examiner's rejection for the reasons set forth below.

As detailed above, the cited references do not teach or suggest the presently claimed method, which includes using only one step of microfiltration with a cutoff of 0.2  $\mu\text{m}$  to filter out particulate material having a particle size of greater than about 0.2  $\mu\text{m}$  from an extract to produce a purified extract comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$  as a filtrate. Puski *et al.* does not cure the deficiencies of Bhatti, Potter *et al.* and Jamas *et al.* Thus, Applicants submit that the combination of Bhatti, Potter *et al.* Jamas *et al.* and Puski *et al.* does not render the claimed subject matter obvious.

In view of the above amendments and remarks, Applicants submit that the claimed subject matter is not obvious from the combination of Bhatti, Potter *et al.*, Jamas *et al.* and Puski *et al.* Withdrawal of this rejection is requested.

### **Rejection Under 35 U.S.C. § 103(a)**

The Examiner has rejected claims 1-6, 9-11, 14-16, 29-32 and 34 under 35 U.S.C. § 103(a) as being unpatentable over Bhatti in view of Potter *et al.* and Jamas *et al.* as applied to claims 1-6, 9, 11, 14-16, 29-32 and 34 above, and further in view of Novozymes (June 1, 2002, novozymes.com). Applicant respectfully traverses the Examiner's rejection for the reasons set forth below.

As detailed above, the cited references do not teach or suggest the presently claimed method, which includes using only one step of microfiltration with a cutoff of 0.2  $\mu\text{m}$  to filter out particulate material having a particle size of greater than about 0.2  $\mu\text{m}$  from an extract to produce a purified extract comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$  as a filtrate. Thus, Applicants submit that the combination of Bhatti and Potter *et al.* and Jamas *et al.* does not render the claimed subject matter obvious. Novozymes does not cure the deficiencies of Bhatti, Potter *et al.* and Jamas *et al.* Thus, Applicants submit that the combination of Bhatti, Potter *et al.*, Jamas *et al.* and Novozymes does not render the claimed subject matter obvious.

In view of the above amendments and remarks, Applicants submit that the claimed subject matter is not obvious from the combination of Bhatti, Potter *et al.*, Jamas *et al.* and Novozymes. Withdrawal of this rejection is requested.

### **Rejection Under 35 U.S.C. § 103(a)**

The Examiner has also rejected claims 1-6, 9-11, 14-16 and 28-34 under 35 U.S.C. § 103(a) as being unpatentable over Bhatti in view of Potter *et al.* and Jamas *et al.* as applied to claims 1-6, 9-11, 14-16, 29-32 and 34 above, and further in view of Morgan (WO 2001/057092). Applicant respectfully traverses the Examiner's rejection for the reasons set forth below.

As detailed above, the cited references do not teach or suggest the presently claimed method, which includes using only one step of microfiltration with a cutoff of 0.2  $\mu\text{m}$  to filter out particulate material having a particle size of greater than about 0.2  $\mu\text{m}$  from an extract to produce

a purified extract comprising  $\beta$  (1-3)  $\beta$  (1-4) glucan having a particle size of equal to or less than 0.2  $\mu\text{m}$  as a filtrate. Morgan does not cure the deficiencies of Bhatti, Potter *et al.* and Jamas *et al.* Thus, Applicants submit that the combination of Bhatti, Potter *et al.*, Jamas *et al.* and Morgan does not render the claimed subject matter obvious.

In view of the above amendments and remarks, Applicants submit that the claimed subject matter is not obvious from the combination of Bhatti, Potter *et al.*, Jamas *et al.* and Morgan. Withdrawal of this rejection is requested.

## Conclusion

In view of the above amendments and remarks, Applicants believe that the present claims satisfy the provisions of the patent statutes and are patentable over the cited prior art. Reconsideration of the application and early notice of allowance are requested. The Examiner is invited to telephone the undersigned to expedite the prosecution of the application.

Respectfully submitted,

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